

ENDANGERED PLANTS OF FAKAHATCHEE  
STRAND STATE PRESERVE

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ABSTRACT

Analysis of the plants in the Fakahatchee Strand State Preserve shows that large numbers of them are on one or more of the rare plant lists. Twenty-seven families and 106 species known from in or near the Preserve are either endangered, threatened and/or commercially exploited. Species endangered in some way constitute 22.2% of those known from the Preserve. This large number of endangered plants within the Preserve heavily reflects the abundant tropical epiphytic element within the temperate plant communities. Comparisons are made with other southern Florida areas to show the uniqueness of the Preserve flora.

Key Words: Endangered plants, Fakahatchee Strand State Preserve, Florida

INTRODUCTION

Many people have been working with endangered plants of Florida for some years, yet few studies have specifically addressed the numbers and percentages of these actual species within designated areas. Most of the existing studies have been made on a species by species basis (e.g., Austin, 1977, 1979, 1981, 1983a, 1983b, 1984, 1986; Austin, Krauss and McMahon, 1978, "Rare and Endangered Plants of Southeastern Florida," report for Connell Metcalf and Eddy, Inc., Coral Gables; Austin and Alvarez, 1979, "Management of the Fakahatchee Strand State Preserve," report for Department of Natural Resources, Tallahassee, FL, and Joint Center for Environmental and Urban Problems, Florida Atlantic University, Boca Raton; Austin, Nauman and Tatje, 1980, "Endangered Species of Southern Florida," report for U.S. Fish and Wildlife Service, Office of Endangered Species, Atlanta, GA; Austin, Nauman and Krauss, 1981, "Endangered Species of Southern Florida," report for U.S. Fish and Wildlife Service, Office of Endangered Species, Atlanta, GA; Ward, 1979; *inter alia*).

With the current knowledge of the plants in the Fakahatchee Strand State Preserve (Austin et al., 1986, 1989), we know that the Preserve has 27 families and 106 species on one or more of the current endangered plant lists (Table 1). This number constitutes over one-fifth of the species (22.2%) known to exist within

or near the borders of the Preserve (Austin et al., 1989). Moreover, these species grow in a preserve that is about 32,640 hectares (80,640 acres), a small area compared to that of the nearby Big Cypress National Preserve.

Species on the endangered list in Fakahatchee Strand State Preserve include 13 families and 33 species of ferns and fern allies, and one cycad. Of these, one fern (*Thelypteris grandis*) has been found nowhere else in the United States (Nauman, 1979). Within the flowering plants there are 11 species of Bromeliaceae, 23 species of Orchidaceae, and four species of Piperaceae, a total of 38 epiphytic species. This epiphytic element constitutes 36% of the endangered flora. Moreover, there are several other orchids that are semi-epiphytic (e.g., *Liparis*, *Malaxis*). These numbers also include an orchid (*Maxillaria conferta*) that has not been found elsewhere within the United States. This number of epiphytes is probably unequaled elsewhere in Florida, and is nowhere exceeded. The balance of endangered species (10 families) within the Fakahatchee Strand State Preserve is made up of non-epiphytic herbs, shrubs and trees.

#### DISCUSSION

The Fakahatchee Strand State Preserve flora may now be compared to other local floras because of the recent species list compilation. Lists for four parks and preserves are compared below (Austin et al., 1978, op. cit.; Duever et al., 1979; Avery and Loope, 1980; Black and Black, 1980).

Duever et al. (1979) made a study that addressed the number of endangered species in the adjacent Big Cypress National Preserve. Within its 230,769 hectares (570,000 acres), an area considerably larger than Fakahatchee Strand State Preserve, Duever et al. (1979) found 124 species considered rare and endangered; their list included occurrences not verified by them or by others. They also noted nine species as being listed by the Florida Department of Agriculture (FDA), which never have been included there (Wood, 1988). They additionally noted three species from the Florida Committee on Rare and Endangered Plants and Animals (FCREPA) list which have not been adopted by the Florida Game and Freshwater Fish Commission. Our corrected total of their endangered species on all lists is 113.

Since the publication by Duever et al. (1979), a more complete

checklist (Black and Black, 1980) has become available for Big Cypress National Preserve. This later list calls into question several of the earlier-included species. Of the 636 species Black and Black, 1980, were able to confirm in the Big Cypress National Preserve, only 81 (or 12.7%) are on the Endangered and Commercially Exploited species lists. If one includes their "possible" list, another 22 species may be added. This inclusion brings the total to 103 endangered species as possibly occurring in the Big Cypress National Preserve, and results in 16.2% of the total flora being endangered; it resolves many of the differences between these two reports. Furthermore, Black and Black, 1980, listed some 23 families which included their potential endangered species. No matter which list is used, the figures on endangered families and species are similar to those listed for Fakahatchee Strand State Preserve. However, the percentage of endangered flora is still well below the figure we found for Fakahatchee Strand State Preserve.

The Fakahatchee Strand State Preserve clearly has a flora similar to that of Big Cypress National Preserve, but in only about one-seventh the geographical area. A comparison of the uncorrected Duever et al. (1979) Big Cypress National Preserve list with the present one for Fakahatchee Strand State Preserve shows a 77.4% similarity (96 shared species of 124) in the flora considered endangered by Duever et al. (1979). A smaller percentage in the Big Cypress National Preserve (78 of the 124 species or 62.9%) is shared with Everglades National Park (Avery and Loope, 1980). Fakahatchee Strand State Preserve has almost twice as many endangered species as Big Cypress National Preserve (29 vs. 15), while Big Cypress National Preserve has more threatened species (95 vs. 65).

Austin et al. (1978, *op. cit.*) made a study for the area around the Turkey Point Power Plant farther east in Dade County. Their study used its own criteria for assigning endangerment, not those applied by Federal and by state agencies. These authors found 175 species in an eight-mile radius around the power plant which they considered to range from Rare to Endangered. Since the exact total flora of the area studied is not known, further comparisons are impossible. Most of the plants in this study are now either on the Florida Department of Agriculture (FDA) list, or were proposed for inclusion by the 1989 legislative session.

Study of the Key Deer and Great White Heron Refuges (Austin

Table 1. Species of endangered (\*), threatened and commercially exploited plants in the Fakahatchee Strand State Preserve.

(\*) Key to Abbreviations: **C** = Commercially Exploited; **E** = Endangered; **FDA** = Florida Department of Agriculture; **PC** = Proposed as Commercially Exploited by FDA for 1989 session; **PD** = Proposed for deletion by FDA for 1989 session; **PT** = Proposed as Threatened by FDA for 1989 session; **T** = Threatened; **UR1** = Under Review for federal listing, with substantial evidence for some degree of biological vulnerability and/or threat; **UR2** = Under Review for federal listing, but substantial evidence of biological vulnerability and/or threat is lacking; **UR4** = Still formally Under Review for listing, but no longer being considered for listing because current taxonomic understanding indicates species is an invalid taxon and thus ineligible for listing; **UR5** = Still formally Under Review for listing, but no longer considered for listing because recent information indicates species is more widespread or abundant than previously believed; **USFWS** = United States Fish and Wildlife Service.

### A. Ferns and Fern Allies

#### 1. Aspidiaceae

*Ctenitis sloanei* (Poepp.) Morton—Florida tree fern. FDA: T.

*C. submarginalis* (Langsd. & Fisch.) Copel.—Comb fern. FDA: T.

*Thelypteris dentata* (Forsk.) E. P. St. John—Downy wood fern. FDA: T.

*T. grandis* A. R. Smith—Large wood fern. First recorded in Florida by Nauman (1979). FDA: T.

*T. hispidula* (Dcne.) Reed var. *versicolor* (E. P. St. John) A. R. Smith—Hispid marsh fern. FDA: T.

*T. interrupta* (Willd.) Iwatsuki—Marsh fern. FDA: T.

*T. kunthii* (Desv.) Morton—Downy marsh fern. FDA: T.

*T. palustris* Schott—Marsh fern. FDA: T.

*T. reticulata* (L.) Proctor—Reticulate marsh fern. FDA: T.

#### 2. Aspleniaceae

*Asplenium auritum* Sw.—Eared spleenwort. FDA: E.

*A. serratum* L.—Birdnest fern. FDA: E.

#### 3. Davalliaceae

*Nephrolepis* × *averyi* Nauman—Avery's sword fern. FDA: T.

*N. biserrata* (Sw.) Schott—Giant sword fern. FDA: T.

*N. exaltata* (L.) Schott—Sword fern. FDA: T.

#### 4. Isoetaceae

*Isoetes flaccida* Shuttlew. ex A. Braun—Quillwort. Found by Taylor Alexander (pers. comm.) just north of Alligator Alley (St. Rd. 84) in the Big Cypress. Probably also occurs south of this road in Fakahatchee. FDA: T.

#### 5. Lycopodiaceae

*Lycopodium dichotomum* Jacq.—Hanging clubmoss. FDA: E.

#### 6. Ophioglossaceae

*Ophioglossum palmatum* L.—Hand fern. FDA: E.

*O. petiolatum* (L.) Mett.—Adder's tongue fern. FDA: T.

#### 7. Osmundaceae

*Osmunda cinnamomea* L.—Cinnamon fern. FDA: PT, PC.

*O. regalis* var. *spectabilis* (Willd.) Gray—Royal fern. FDA: C.

Table 1. Continued.

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8. Polypodiaceae  
*Campyloneurum angustifolium* (Sw.) Fée—Narrow strap fern. FDA: E.  
*C. costatum* (Kuntze) K. Presl—Tailed strap fern. FDA: E.  
*C. phyllitidis* (L.) Presl f.—Strap fern. FDA: T.  
*C. phyllitidis* f. *latum* (Moore) Proctor—Stalked strap fern. FDA: T.  
*Phlebodium aureum* (L.) J. E. Smith—Cabbage palm fern. FDA: T.  
*Polypodium ptilodon* var. *caespitosum* (Jenman) A. M. Evans—Greater comb fern. FDA: T.
9. Psilotaceae  
*Psilotum nudum* (L.) Pal.-Beauv.—Whisk fern. FDA: T.
10. Pteridaceae  
*Acrostichum aureum* L.—Coastal leather fern. FDA: E.  
*A. danaeifolium* Langsd. & Fisch.—Leather fern. FDA: T.  
*Pteris vittata* L.—Ladder brake. FDA: T.  
*P. tripartita* Sw.—Giant brake. Widespread, although sporadic. Not confirmed within the Preserve. FDA: T.
11. Salviniaceae  
*Azolla caroliniana* Willd.—Mosquito fern. FDA: T, PD.
12. Vittariaceae  
*Vittaria lineata* (L.) J. E. Smith—Shoe-string fern. FDA: T.
- B. Cycads**
13. Cycadaceae  
*Zamia pumila* L.—Coontie. Oral report by Ranger Goble from the northwestern pine islands in the Preserve, but not confirmed. FDA: C.
- C. Flowering Plants**
14. Acanthaceae  
*Elytraria carolinensis* (J. F. Gmel.) Pers. var. *angustifolia* (Fernald) Blake. FDA: T.
15. Aquifoliaceae  
*Ilex cassine* L.—Dahoon holly. FDA: PC.
16. Arecaceae  
*Acoelorrhaphe wrightii* (Griseb. & Wendl.) Wendl. ex Becc.—Paurotis palm. FDA: T.  
*Roystonea elata* (Bartr.) Harper—Royal palm. FDA, USFWS: E, UR1.
17. Asteraceae  
*Melanthera parvifolia* Small (= *Melanthera nivea* (L.) Small). USFWS: UR2.
18. Bromeliaceae  
*Catopsis berteroniana* (Schultes f.) Mez—Yellow catopsis. FDA: E.  
*C. floribunda* (Brongn.) L. B. Smith—Many-flowered catopsis. FDA: E.  
*C. nutans* (Sw.) Griseb.—Small catopsis. FDA: E.  
*Guzmania monostachia* (L.) Rusby ex Mez—Strap-leaved air plant. FDA: E.  
*Tillandsia balbisiana* Schultes—Reflexed wild pine. FDA: T.  
*T. fasciculata* Sw.—Stiff-leaved wild pine. FDA: C.  
*T. paucifolia* Baker (= *T. circinnata* Schlecht.)—Twisted wild pine. FDA: T.
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Table 1. Continued.

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- T. pruinosa* Sw.—Fuzzy-wuzzy air plant. FDA: E.  
*T. setacea* Sw.—Needle-leaf air plant. FDA: T.  
*T. utriculata* L.—Giant wild pine. FDA: C.  
*T. variabilis* Schlecht. (= *T. valenzuelana* A. Richard)—Soft-leaved wild pine. FDA: T.
19. Burmanniaceae  
*Burmannia flava* Mart.—Fakahatchee burmannia. FDA: E.
20. Euphorbiaceae  
*Stillingia sylvatica* ssp. *tenuis* (Small) Rogers—Corkwood. USFWS: UR2.
21. Lentibulariaceae  
*Pinguicula pumila* Michx.—Butterwort. FDA: PT.  
*Pinguicula* sp.—Butterwort. Different from the preceding fide A. Herndon. Specimen not seen. FDA: PT.
22. Myrtaceae  
*Myrcianthes fragrans* (Sw.) McVaugh var. *simpsonii* (Small) Long—Simpson's stopper. USFWS: UR2.
23. Orchidaceae  
*Bletia purpurea* (Lam.) DC.—Pine pink. FDA: T.  
*Bulbophyllum pachyrhachis* (A. Richard) Griseb.—Rat-tail orchid. FDA: E.  
*Calopogon pallidus* Chapman—Pale grass-pink. FDA: T.  
*C. tuberosus* (L.) BSP.—Grass pink. FDA: T.  
*Campylocentrum pachyrrhizum* (Reichenb. f.) Rolfe—Crooked-spur orchid. FDA: E.  
*Cyrtopodium punctatum* (L.) Lindley—Cow-horn orchid. FDA: E.  
*Encyclia cochleata* (L.) Dressler (= *Anacheilum cochleatum* (L.) Hoffmann-segg)—Clam-shell orchid. FDA: T.  
*E. pygmaea* (Hook.) Dressler—Dwarf epidendrum. FDA: E.  
*E. tampensis* (Lindley) Small—Butterfly orchid. FDA: T.  
*Epidendrum anceps* Jacq.—Brown orchid. FDA: T.  
*E. blancheanum* Urban (= *E. acunae* Dressler)—Ramosse orchid. FDA: E.  
*E. difforme* Jacq. (= *Neolehmannia difformis* (Jacq.) Pabst)—Umbelled orchid. FDA: T.  
*E. nocturnum* Jacq.—Night orchid. FDA: T.  
*E. rigidum* Jacq.—Rigid orchid. FDA: T.  
*E. strobiliferum* Reichenb. f.—Twisted orchid. FDA: T.  
*Erythrodes querceticola* (Lindley) Ames (= *Platytheles querceticola* (Lindley) Garay)—Oak orchid. FDA: T.  
*Eulophia alta* (L.) Fawcett & Rendle—Wild coco. FDA: T.  
*Habenaria distans* Griseb.—False water-spider orchid. FDA: T.  
*H. nivea* (Nutt.) Sprengel (= *Platanthera nivea* (Nutt.) Luer)—Snowy orchid. FDA: T.  
*H. odontopetala* (Reichenb.) Small—Tooth-petal orchid. Doubtful (based on oral report); no specimen known. FDA: T.  
*H. quinqueseta* (Michx.) A. A. Eaton—Long-horned orchid. FDA: T.  
*H. repens* Nutt.—Water spider orchid. FDA: T.  
*Harrisella filiformis* (Sw.) Cogn. (= *H. porrecta* (Reichenb.) Fawcett & Rendle)—Extended orchid. FDA: T.
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Table 1. Continued.

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- Ionopsis utricularioides* Lindley—Delicate orchid. FDA: E.
- Leochilus labiatus* (Sw.) Kuntze—Smooth lip orchid. Doubtful (based on oral report); no specimen known. FDA: T.
- Lepanthopsis melanantha* (Reichenb. f.) Ames—Tiny orchid. FDA: E.
- Liparis nervosa* (Thunb.) Lindley (= *L. elata* Lindley)—Shiny-leaf orchid. FDA: T.
- Malaxis spicata* Sw.—Florida malaxis. FDA: T.
- Maxillaria crassifolia* (Lindley) Reichenb. f.—False butterfly orchid. FDA: E.
- M. conferta* (Griseb.) C. Schweinf. ex Leon—Originally found by Roger Hammer, and later reported by him for Collier Co. (Bull. Fairchild Trop. Gard. 36: 16–18. 1981). A specimen was collected by Carl Luer; there is a voucher at the Marie Selby Botanical Gardens (SEL), Sarasota (R. M. Adams, pers. comm.). FDA: T.
- Oncidium floridanum* Ames—Mule-ear orchid. FDA: T.
- Pleurothallis gelida* Lindley—Frosted-flower orchid. FDA: T.
- Polyrrhiza lindenii* (Lindley) Cogn.—Ghost orchid. FDA: E.
- Polystacha concreta* (Jacq.) Garay & Sweet—Many-spiked orchid. FDA: T.
- Ponthieva racemosa* (Walt.) Mohr—Shadow witch. FDA: T.
- Spiranthes cernua* (L.) L. C. Rich. var. *odorata* (Nutt.) Correll—Nodding ladies' tresses. FDA: T.
- S. cranichoides* (Griseb.) Cogn. (= *Beadlea cranichoides* (Griseb.) Small)—Helmit ladies' tresses. FDA: T.
- S. lacinata* (Small) Ames—Lace-lip ladies' tresses. FDA: T.
- S. lanceolata* (Aublet) Leon var. *lanceolata* (= *Stenorrhynchos lanceolatus* (Aublet) L. C. Rich ex Spr.; *Sacoila lanceolata* (Aubl.) Garay). FDA: T.
- S. lanceolata* var. *paludicola* Luer (= *Sacoila lanceolata* var. *paludicola* (Luer) Sauleta et al.)—Fakahatchee ladies' tresses. FDA, USFWS: T, UR2.
- S. longilabris* Lindley—Long-lip ladies' tresses. FDA: T.
- S. praecox* (Walt.) Watson—Giant ladies' tresses. FDA: T.
- S. vernalis* Engelm. & Gray—Spring ladies' tresses. FDA: T.
- Vanilla phaeantha* Reichenb. f.—Leafy vanilla. FDA: T.
24. Piperaceae
- Peperomia glabella* (Sw.) A. Dietr.—Cypress peperomia. FDA: E.
- P. humilis* A. Dietr. For reasons that are not clear, Avery and Loope (1981) reported this species under the name *P. questeliana* Stehel & Trel. This name is clearly a later one since it was published in 1940 and *P. humilis* was published in 1831. See Boufford, J. Arnold Arbor. 63: 324. 1982. FDA: E.
- P. obtusifolia* (L.) A. Dietr. (= *P. floridana* Small)—Florida peperomia. FDA: E.
- P. simplex* Ham.—Green peperomia. Reported by Long and Lakela (1971); no specimen seen. See Boufford, J. Arnold Arbor. 63: 324. 1982. FDA: E.
25. Poaceae
- Schizachyrium scoparium* (Michx.) Nash [= *S. rhizomatium* (Swallen) Gould]—Little bluestem. FDA, USFWS: E, UR4.
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Table 1. Continued.

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26. Rhamnaceae	
<i>Sageretia minutiflora</i> (Michx.) Mohr—Buckthorn.	USFWS: UR5.
27. Sapotaceae	
<i>Chrysophyllum oliviforme</i> L.—Satinleaf.	FDA: E.

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et al., 1980, op. cit.) showed that they supported 94 families and 492 species. Of this total, only 19 families and 41 species (8.3%) are endangered. These figures include seven families and 14 species of ferns, as well as six Bromeliaceae, and one Orchidaceae.

All data indicate that Fakahatchee Strand State Preserve has a higher percentage of endangered species than other southern Florida parks and preserves. Moreover, all these data reinforce the contention that has been voiced over the past decade and a half that southern Florida has more endangered species than most other areas in the eastern United States. Of the 282 species listed in one category or another for southern Florida by Wood (1988), 37.6% are in Fakahatchee Strand State Preserve. Everglades National Park has fewer, with some 27% of the total. Southern Florida perhaps has more endangered species than any area east of Texas; perhaps even more than that state (D. B. Ward, pers. comm.).

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